Sumy State University
Educational and Scientific Medical Institute
Department of Public Health

Exam structure of the discipline
«Microbiology, virology and immunology»

The exam of the discipline «Microbiology, virology and immunology» consists of two stages:

(I) test control on the basis of questions «KROK-1» (computer test), a positive result is obtained by 80% of correct results for 20 test questions.

(II) answers to 2 questions of the exam ticket, on the topics that were covered at the lectures, were studied during practical classes and were recommended for self-study. Knowledge control of the sections «Special, clinical and sanitary microbiology» and «Special virology» is carried out by means of computer testing (practically oriented task (situational task), which includes 20 questions (a positive result is equal to 60% of correct answers to 20 questions) and a written answer to one question (from the section «General microbiology. Genetics of bacteria» or «Immunology»). Stage II of the exam is considered passed if each of the questions is passed for a positive grade.

The exam is credited to the student **if each of the exam stages** (testing on the basis of KROK-1 questions, a situational task from the sections «Special, clinical and sanitary microbiology» or «Special virology», question from the sections «General bacteriology. Genetics of bacteria» or «Immunology») **was passed at least for a grade of "3" on the national scale.**

List of exam questions of the discipline "Microbiology, Virology and Immunology", for students of specialties "Medicine" and "Pediatrics»

CHAPTER I «General bacteriology. Microorganism genetics»

1. Tasks of medical microbiology, development stages of microbiology. L. Pasteur's discovery and their role in the development of medical science. R. Koch's works and their influence on the microbiology progress.
2. I. Mechnikov and his contribution to the doctrine of immunity to infectious diseases. P. Ehrlich, J. Bordet as the founders of the doctrine of humoral immunity.
3. Research by D.I. Ivanovsky – an important stage in virology development. Ukrainian microbiological school. The works of D.K. Zabolotny, V.D. Drobotko, S.S. Dyachenko, K. D. Pyatkina and others.
4. Systematics and nomenclature of microorganisms. Classification principles. The concept of a species, variety, biotype, strain, clone.

5. Microscopic method of diagnosing infectious diseases: purpose, advantages and disadvantages. Microscopic diagnostic method stages. Modern methods of microscopic examination: purpose of using and principles of methods.

6. Bacterial morphology and structure. The role of individual structures of the bacteria in their vital activity and the pathogenesis of infectious diseases. Methods of their detection.

7. Features of gram-positive and gram-negative bacteria cell wall structure. Technique and principle of Gram staining method. Capsule, microcapsule, bacterial mucous layer, their chemical composition and significance, detection methods.

8. Bacterial flagella. Pili, their classification and function. Bacteria motility and determination methods.

9. Bacterial spores: varieties, structure. Spore formation in bacteria. Examples of pathogenic spore-forming bacteria. Spore detection methods.

10. Spirochetes morphology and ultrastructure. Morphological varieties, pathogenic species. Spirochetes detection methods.

11. Rickettsia morphology and ultrastructure. The main species pathogenic for human . Rickettsia detection methods.

12. Chlamydia: morphology; development cycle; the main species pathogenic to humans. Mycoplasmas: morphology; structural features; the main species pathogenic to humans. Chdamydia and mycoplasma detection methods.

13. Types and mechanisms of microbial nutrition. Culture media are used in microbiology, their classification and requirements for them.

14. Bacteria respiration. Aerobic and anaerobic respiration. Enzymes and cell structures that involved in the respiration process. Cultivation methods for anaerobic bacteria.

15. Bacterial enzymes, their role in metabolism. Enzymes of pathogenicity. Using enzymes to identify bacteria.

16. Bacterial growth and reproduction. The mechanism of cell division, phases of the growth of microbial population under optimum conditions.

17. Bacteriological culture methods. The principles of a pure culture isolation of bacteria and their identification.

18. Heredity in microorganisms. Bacterial genotype and phenotype. Genetic variability, mechanisms. Mutations and their varieties. Physical, chemical and biological mutagens. Plasmids (F-, Col-, Ent-, R-plasmids).

19. Genetic recombinations: transformation, transduction, conjugation. The role of mutations, recombinations in the emergence of atypical, pathogenic and resistant to antibiotics and chemotherapy strains of microorganisms. Examples.

20. Genetic engineering and its practical using in medical microbiology. PCR: purpose, principle.

21. Microbiological basis of genetic engineering and biotechnology. Microorganisms-producers of biologically active substances, that are used in medical practice. The using of microorganisms and their enzymes in biotechnology for the amino acids, vitamins, hormones, and antibiotics production. Genetic engineering methods for creating vaccine strains of microorganisms.

22. Commensalism, mutualism, parasitism. Synergism, antagonism of microorganisms. The phenomenon of antagonism in microorganisms and the role of microbiologists in the studying of microorganisms antagonism theory.

23. Impact of physical, chemical and biological factors on microorganisms. Practical use. Sterilization methods.

24. Asepsis, antiseptics. Antiseptic products and materials.

25. Antibiotics: definition, production principles, classification by origin and chemical structure. Antimicrobial drugs: action mechanism, classification. Measurement units of antimicrobial activity. WHO AWaRe classification of antibiotics.

26. Mechanisms of the antibiotics biological action on a microbial cell. Natural and acquired resistance of microorganisms to antibiotics.

27. Principles of optimal antibiotic therapy. Side effects of antimicrobial therapy. The role of antibiotic-resistant microbes in medical practice. Ways to overcome drug resistance.

28. Laboratory determination method (EUCAST) and antimicrobial susceptibility assessment of microorganisms. Units of the antimicrobial activity measurement of antibiotics. Antibiotics. Antibiotic-resistant, antibiotic-dependent and antibiotic-tolerant bacterial strains.

29. Chemotherapeutic antimicrobial agents. Their classification by chemical structure. Chemotherapy index.

30. Stages of a pure culture isolation of aerobic microbes. Examples of aerobic and facultative anaerobic bacteria in Latin.

31. Stages of a pure culture isolation of obligate anaerobic microbes. Examples of obligate anaerobic bacteria in Latin.

32. Biological method for the diagnosis of infectious diseases (purpose, principle, examples of infectious diseases in which this method is used).

33. Viruses: structure, characteristics. Features of microbiological diagnostics of viral infections. Principles of virus cultivation. The main stages of virus cultivation: accumulation, indication and identification.

34. Bacterial viruses (bacteriophages), general characteristics. The phenomenon of bacteriophagy. The use of virulent phages in medicine and microbiology.

35. Bacterial viruses (bacteriophages), general characteristics. The phenomenon of lysogeny. Phage conversion. Use of mild bacteriophages.

36. Subcellular forms of bacteria: protoplasts and spheroplasts, L-forms of bacteria.

CHAPTER II «Normal microflora. Infection doctrine. Immunity»

1. Definition of the terms "pathogenicity" and "virulence" of bacteria. Factors of bacterial pathogenicity. Virulence quantification: LD 50, DLM.

2. Bacterial toxins, their classification: exotoxins and endotoxins, chemical composition, properties, mechanism of action in the body, practical application. Endotoxic shock: causes of development. Determination of bacterial toxigenicity.

3. Normal microflora of the large intestine and its importance for the body. The value of the normal microflora of different human bioloci as one of the factors of the first line of the body defense.

4. Dysbacteriosis (dysbiosis): definition, classification, causes of development, diagnosis, prevention and treatment. Prebiotics, probiotics and synbiotics: composition, purpose of use, action mechanism.

5. Studying methods of the role of normal microflora in the human body. Modern ideas of biofilm formation process. The value of normal microflora residents in the development of pathological processes (dysbiosis, autoinfection, opportunistic infections).

6. Development periods of an infectious disease. Primary localization of infectious diseases causative agents in the body, its practical significance in laboratory diagnostics. Infectious dose of the pathogen.

7. Infection and infectious process. Occurrence factors of an infectious process. The main links of the infectious process. The role of the microorganism, macroorganism and environment in the development of the infectious process. The concept of the pathogenesis of an infectious disease.

8. Infection sources, mechanisms and routes of transmission, infection entry gates. Examples.

9. Infection forms: exogenous, endogenous, focal, generalized, monoinfection, mixed, secondary infection, coinfection, emergent infections, iatrogenic infections. Examples.

10. Ways of microorganisms spread and their toxins in the body (bacteremia, septicemia, toxinemia, viremia).

11. Pathogen carriage, its detection, medical significance. Generalized infection: forms, causes of development, principles of diagnosis and immunotherapy.

12. Forms of infection manifestation: acute, chronic, latent, persistent, reinfection, superinfection.

13. Microbiological methods for the infectious disease diagnosis at different periods of the infectious process development.

14. Antigens: definition, structure, basic properties, role in the immune response. Antigens of a macroorganism: antigens of the major histocompatibility complex, CD antigens. Autoantigens. Superantigens.

15. Antigens as inducers of the immune response. Antigens structure. Complete and incomplete antigens (haptens), their characteristics.

16. Antigenic structure of a bacterial cell. Protective antigens. Antigenic structure of viruses. Practical application of bacterial and viral antigens.

17. Types of immunity, forms of its manifestation, general characteristics. Organs of the immune system and immunocompetent cells.

18. Innate immunity: general characteristics, general physiological protective factors (protective functions of the skin, mucous membranes, lymph nodes). Inflammation and its functions.

19. Humoral factors of innate immunity: general characteristics, complement system, properties, activation pathways, participation in immunological and allergic reactions.

20. Humoral factors of innate immunity: general characteristics, cytokines, interferon system, lysozyme.

21. Cellular factors of the human body innate defense. Natural killer cells. Mononuclear phagocyte system: functions, connection with specific defense factors.

22. Phagocytosis, its role in protection against infectious diseases. Completed and incomplete phagocytosis, study methods. Causes of incomplete phagocytosis.

23. Major histocompatibility complex: localization, gene polymorphism, HLA system, class 1 and 2, loci, localization in the body, functions.

24. Humoral adaptive immune response: definition, phases and formation mechanism (to draw the scheme of interaction of the immune system cells and give explanations to it). Role of cells, cytokines and the HLA system in the humoral immune response.

25. Antitoxic immune response: definition, conditions of formation, phases and mechanism of formation (to draw the scheme of interaction of the immune system cells and give explanations to it). Obtaining antitoxic sera, their titration and practical application, methods of administration for therapy and express prophylaxis. Examples of antitoxic sera.

26. Antibodies: definition, structure (schematic), classes, properties and functions, practical application. Autoantibodies: properties. Monoclonal antibodies: production principle, practical application.

27. Cytotoxic type of cellular adaptive immune response (to draw the scheme of interaction of the immune system cells and give explanations to it): definition, conditions of formation, phases, effector link, mechanism of cytotoxic action of T (CD8) cells. Cells role, cytokines and the HLA system in the cellular immune response.

28. Inflammatory type of cellular adaptive immune response (to draw the scheme of interaction of the immune system cells and give explanations to it): definition, conditions of formation, phases, effector link, mechanism of formation. Cells role, cytokines and the HLA system in the cellular immune response.

29. Antibacterial immunity: definition, types, factors, forms. Mechanisms of immune neutralization of infectious diseases pathogens, their toxins and enzymes.

30. Antiviral immunity. Mechanism and features of antiviral protection.

31. The essence of transplant immunity and ways to overcome it. Immunosuppressants.

32. Antitumor immunity. Mechanism and features of formation.

33. The body's immune response: definition, phase and shape. Provide a general diagram and explanations for it. Cells, cytokines and HLA molecules involved in the immune response. Regulation of the immune response in the body.

34. Cytokines: definition, composition, properties, classification, role in the cellular and humoral immune response, practical use in medicine.

35. Immune status: definition, aims, principles and research methods. Immunogram.

36. Flow cytometry: the aim of practical use, the setting principle and results interpretation.

37. Anaphylactic type of allergy: allergens, periods and mechanism of development, clinical manifestations, principles of diagnosis, prevention.

38. Cytotoxic type of allergic reactions: allergens, mechanism of development, clinical manifestations, principles of diagnosis.

39. Immunocomplex type of allergic reactions: allergens, mechanism of development, clinical manifestations, principles of diagnosis.

40. IV type of allergic reactions: allergens, mechanism of development, clinical manifestations, principles of diagnosis.

41. Types of immune system dysfunctions (immunopathology). Immunodeficiencies: definition, classification, clinical manifestations. Principles of immunodeficiencies diagnosis and treatment.

42. Autoimmune (autoaggressive) diseases: definition, mechanisms of development. Principles of treatment and prevention of autoimmune diseases.

43. Primary and secondary immune response. Memory cells, practical value. Immunological tolerance: definition, types, mechanisms, practical use. Regulation of the immune response in the body: a list of factors and mechanisms.

44. Immunotherapy of infectious diseases using sera, immunoglobulins and vaccines. Principles, mechanisms. Examples.

45. Therapeutic and prophylactic immune sera: obtaining, titration. Mechanism of action. Examples. Prevention of complications.

46. Immunoglobulins: definition, preparation, purpose of use.

47. Vaccine prophylaxis, types of vaccines. Preparation and administration methods. Adverse occasions after vaccination. Methods for studying the tension of post-vaccination immunity. National guidelines for vaccination in a COVID-19 pandemic.

48. Vaccination calendar in Ukraine. Types of prevention: primary, secondary, tertiary. Active and passive immunoprophylaxis. Vaccination for health reasons. Emergency (post-exposure) prophylaxis. Immunoprophylaxis for travelers.

49. Agglutination reactions: mechanism, varieties, components, purpose of practical application, principle of results statement and interpretation.

50. Precipitation reaction: varieties, components, mechanism, purpose, practical application, principle of results statement and interpretation.

51. Immunofluorescence (IF): varieties, components, mechanism, purposes of application, principle of results statement and interpretation.

52. Enzyme-linked immunosorbent assay (ELISA): components, mechanisms, purpose of practical application, principle of results statement and interpretation.

53. Complement fixation test (CFT): components, mechanism, purposes of application, examples.

54. Indirect hemagglutination assay (IHA): components, mechanisms, purpose of application, principle of results statement and interpretation.

55. Neutralization reaction (NR): components, mechanism, purposes of application, examples, principle of results statement and interpretation.

56. Polymerase chain reaction: the purpose of practical application, principle of results statement and interpretation.

CHAPTER III «Special and sanitary bacteriology»

1. Microbiology of staphylococcal infections. Morphological, tinctorial, cultural, antigenic and pathogenic characteristics of staphylococcal infections pathogens. Epidemiology, pathogenesis and microbiological diagnostics of staphylococcal infections. Characteristics of immunity, which is formed during staphylococcal infections. Treatment and prevention of purulent-inflammatory staphylococcal infections.

2. Microbiology of food intoxication of staphylococcal etiology. Morphological, tinctorial, cultural, antigenic and pathogenic characteristics of causative agents of food intoxication of staphylococcal etiology. Epidemiology, pathogenesis and microbiological diagnostics of food intoxication of staphylococcal etiology. Phage typing to determine the source of infection (setting principle, interpretation of results). Characteristics of the immunity that forms during food intoxication of staphylococcal etiology. Treatment and prevention of food intoxication of staphylococcal etiology.

3. Microbiology of staphylococcal sepsis. Morphological, tinctorial, cultural, antigenic and pathogenic characteristics of causative agents of staphylococcal sepsis. Epidemiology, pathogenesis and microbiological diagnosis of staphylococcal sepsis. Prevention and treatment of staphylococcal sepsis. Staphylococcal toxoid (give a description of the drug).

4. Causative agents of streptococcal sepsis. Morphological, tinctorial, cultural, antigenic and pathogenic properties of pathogens of streptococcal sepsis. Epidemiology, pathogenesis and microbiological diagnostics of streptococcal sepsis. Prevention and treatment of streptococcal sepsis. Streptococcal bacteriophage (give a description of the drug).

5. Microbiology of scarlet fever. Morphological, tinctorial, cultural, antigenic and pathogenic properties of the causative agent of scarlet fever. Epidemiology, pathogenesis and microbiological diagnostics of scarlet fever. Prevention and treatment of scarlet fever.

6. Streptococcus pneumoniae. Morphological, tinctorial, cultural, antigenic and pathogenic properties of the causative agent of streptococcal pneumonia. Epidemiology, pathogenesis and microbiological diagnostics of streptococcal pneumonia. Prevention and treatment of streptococcal pneumonia.

7. Causative agents of rheumatoid arthritis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, laboratory diagnostics and prevention of rheumatoid arthritis. Streptolysin O (give a description of the drug).

8. Microbiology of meningococcal infection. Morphological, tinctorial, cultural, antigenic and pathogenic properties of meningitis. Epidemiology, pathogenesis, immunity, laboratory diagnostics and prevention of meningococcal infection. Chemical meningococcal vaccine (give a description of the drug).

9. Gonococci. Morphological, tinctorial, cultural, antigenic and pathogenic properties of the infectious agent. Epidemiology, pathogenesis, immunity, microbiological diagnostics and prevention of gonococcal infection (gonorrhea, blenorrhea). Treatment features of the chronic form of gonococcal infection. Gonococcal killed vaccine (give a description of the drug).

10. Escherichia. Morphological, tinctorial, cultural, antigenic and pathogenic properties of Escherichiosis pathogens. Classification of pathogenic E. coli. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of diarrheogenic Escherichiosis.

11. Causative agents of typhoid fever. Morphological, tinctorial, cultural, antigenic and pathogenic properties of typhoid fever. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of typhoid fever. Typhoid tabletted bacteriophage (give a description of the drug).

12. Causative agents of paratyphoid A and B. Morphological, tinctorial, cultural, antigenic and pathogenic properties of pathogens of paratyphoid A and B. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of paratyphoid A and B. Hiss media – the composition and purpose of its use on the example of paratyphoid pathogens A and B. Explain the essence of using differential diagnostic media with carbohydrates.

13. Salmonella – causative agents of acute gastroenteritis, classification. Morphological, tinctorial, cultural, antigenic and pathogenic characteristics of acute gastroenteritis pathogens. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of Salmonella gastroenteritis. Polyvalent salmonella bacteriophage (give a description of the drug).

14. Causative agents of bacterial dysentery. Morphological, tinctorial, cultural, antigenic and pathogenic characteristics of the causative agents of bacterial dysentery. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of bacterial dysentery. Tableted polyvalent dysentery bacteriophage (give a description of the drug).

15. Helicobacteria: morphological, tinctorial, cultural, antigenic and pathogenic properties, role in human pathology. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of helicobacteriosis. Make a record and describe the principle of a quick test for the detection of Helicobacteria in biological material.

16. Microbiology of cholera. Vibrio cholerae: morphological, tinctorial, cultural, antigenic and pathogenic properties, biovars. NAG vibrios. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of cholera. Cholera vaccine (cholerogen-toxoid + O-antigen) – give a description of the drug.

17. Yersinia pseudotuberculosis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of pseudotuberculosis.

18. Causative agents of campylobacteriosis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of campylobacteriosis.

19. *Yersinia enterocolitica*: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of intestinal yersiniosis. Enteroyersin (give a description of the drug).

20. Microbiology of plague. Morphological, tinctorial, cultural, antigenic and pathogenic properties of the plague pathogen. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of plague. Plague immunoglobulin (give a description of the drug).

21. Causative agent of tularemia: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of tularemia. Live attenuated tularemia vaccine (give a description of the drug).

22. Causative agents of brucellosis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of brucellosis. Features of chronic brucellosis treatment. The use of Wright and Hedelson the reactions for the diagnosis of brucellosis, principles of reactions, purpose of application, components.

23. Causative agent of anthrax: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of anthrax. The principle of the Ascoli reaction, purpose, components, accounting of the reaction results.

24. Mycobacterium tuberculosis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of tuberculosis. The problem of multiple resistance of the causative agent of tuberculosis. Tuberculosis associated with HIV infection. BCG (give a description of the drug). Tuberculin (give a description of the drug, indicate the features of its use).

25. Causative agent of diphtheria: morphological, tinctorial, cultural, antigenic and pathogenic properties, biovars. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of diphtheria. PR in gel: purpose of setting, principle of reaction, interpretation of results. DTaP (give a description of the drug).

26. Causative agent of pertussis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of pertussis. Pertussis antigen (give a description of the drug).

27. Causative agent of tetanus: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of tetanus. The principle of setting the neutralization reaction in the diagnosis of tetanus.

28. Causative agent of botulism: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of botulism. Anti-botulinum antitoxic multivalent serum (give a description of the drug).

29. Causative agent of anaerobic gas infection: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity,

microbiological diagnostics, treatment and prevention of anaerobic gas infection. Sextanatoxin (give a description of the drug).

30. Causative agent of syphilis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of syphilis. Vaserman's reaction and RMP: principle, components, accounting and interpretation of results.

31. Causative agent of leptospirosis: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of leptospirosis. Leptospirosis killed vaccine (give a description of the drug).

32. Causative agent of relapsing fever: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of relapsing fever.

33. Pathogenic mycoplasmas: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of urogenital mycoplasmosis.

34. Pathogenic mycoplasmas: morphological, tinctorial, cultural, antigenic and pathogenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of respiratory mycoplasmosis.

35. Rickettsia, general characteristics of causative agents of epidemic and endemic typhus. Morphological, tinctorial, cultural, antigenic and pathogenic properties of rickettsia. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention.

36. Rickettsia, general characteristics of causative agents of epidemic and endemic typhus. Morphological, tinctorial, cultural, antigenic and pathogenic properties of rickettsia. Epidemiology, pathogenesis, immunity, microbiological diagnostics, treatment and prevention of Q fever.

37. Chlamydia: structure, pathogenic and antigenic properties, life cycle. Causative agents of urogenital chlamydial infections: pathogenesis, immunity, laboratory diagnostics, disease prevention.

38. Chlamydia: structure, pathogenic and antigenic properties, life cycle. The causative agents of psittacosis: pathogenesis, immunity, laboratory diagnostics, disease prevention.

39. The Peptostreptococci genus, as causative agents of purulent-inflammatory processes of various localization. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

40. Legionella, the role of the pathogen in the structure of infectious diseases. Epidemiology, pathogenesis, methods of diagnosis and prevention of legionellosis.

41. The Veilonella genus, as causative agents of purulent-inflammatory processes of different localization. Epidemiology, pathogenesis of diseases that cause Veilonella and the principles of their diagnosis, treatment, prevention.

42. Moraxella: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases causing moraxels and the principles of their diagnosis, treatment, prevention.

43. Gardnerella: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention of gardnerellosis.

44. The Morganella genus: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

45. The Providence genus: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

46. The Pasteurela genus: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

47. Pathogens of yaws, pints: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

48. Causative agent of human actinomycosis: biological properties, significance in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

49. Anaerobic non-clostridial bacteria and anaerobic cocci. Role in human pathology. Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

50. Pseudomonas aeruginosa: morphological, tinctorial, antigenic and pathogenic properties, the importance of the occurrence of nosocomial infections. Epidemiology, pathogenesis, laboratory diagnostics, prevention of Pseudomonas aeruginosa infection.

51. Klebsiella: morphological, tinctorial, antigenic and pathogenic properties. Pathogenesis, immunity, microbiological diagnostics, prevention of Klebsiella infections.

52. Causative agent of candidiasis, general characteristics. Epidemiology, pathogenesis, immunity, principles of microbiological diagnostics, criteria for the diagnosis of candidiasis, treatment and prevention of candidiasis. The principle of determining the sensitivity of a pure culture of the Candida genus fungi to antimycotics (disk-diffusion method).

53. Pathogenic dermatomycetes, general characteristics. Pathogenicity for humans. Epidemiology, pathogenesis and microbiological diagnostics of dermatomycosis (microsporia, trichophytosis, fausa, epidermophytosis), principles of treatment and prevention of diseases.

54. Causative agents of deep mycoses: pneumocystosis, blastomycosis, histoplasmosis, cryptococcosis. Properties, pathogens pathogenicity of deep mycoses for humans. Epidemiology, pathogenesis of deep mycoses and the principles of their diagnosis, treatment, prevention.

55. Morphology and structure of medically significant protozoa (amebiasis, trichomanosis, toxoplasmosis). Epidemiology, pathogenesis of diseases and the principles of their diagnosis, treatment, prevention.

56. Water microflora. Sanitary indicative microorganisms. Regulatory characteristics. Waterborne pathogens. Methods of sampling and research of the

water sanitary and bacteriological state. Determination of the coli-titer and coli-index of drinking water by the fermentation method and the method of membrane filters (principle of methods, interpretation of the obtained results).

57. Air microflora. Sanitary indicative microorganisms. Regulatory characteristics. Airborne pathogens. Methods for sampling and research of the air sanitary and bacteriological state. Sedimentation and aspiration methods for determining the sanitary state of air (purpose, principle, results interpretation).

58. Microflora of food products (milk). Sanitary indicative microorganisms. Regulatory characteristics. Milk-borne pathogens. Sampling methods and the principle of sanitary-bacteriological examination of food products (milk). Evaluation criteria for sanitary-bacteriological examination of milk.

59. Microbiota of medicines and cosmetics, food products; ways of their pollution; decontamination means and mechanisms; microbiological monitoring of pharmaceutical, cosmetic products.

CHAPTER IV «Special virology»

1. Orthomyxoviruses: general characteristics. Human influenza virus, antigenic structure and variability. Epidemiology, pathogenesis, immunity, laboratory diagnostics, treatment and specific prevention of influenza. Dry type-specific influenza diagnosticum type A1 (H1N1), live influenza vaccine (give a description of the drugs).

2. Paramyxoviruses: general characteristics. Respiratory syncytial virus: antigenic structure. Epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention of RS-infection. Human leukocyte interferon (give a description of the drug).

3. Paramyxoviruses: general characteristics. The causative agent of parainfluenza infection: antigenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, prevention of parainfluenza. Parainfluenza serum type I (give a description of the drug).

4. Paramyxoviruses, general characteristics. Measles virus: antigenic structure. Epidemiology, pathogenesis, immunity, microbiological diagnostics, specific prevention of measles. Erythrocyte diagnosticum for measles (give a description of the drug).

5. Adenoviruses, general characteristics. Adenoviruses, causative agents of respiratory infections: antigenic properties. Oncogenic properties of adenoviruses associated with the properties of E1A and E1B from the standpoint of evidence-based medicine. Epidemiology, pathogenesis, immunity, microbiological diagnostics, prevention of adenovirus infections.

6. Paramyxoviruses, general characteristics. Mumps virus. Epidemiology, pathogenesis, immunity, microbiological diagnostics, specific prevention of mumps. Mumps vaccine (give a description of the drug).

7. Togaviruses, a social trait. Rubella virus: antigenic properties. Epidemiology, pathogenesis, immunity, microbiological diagnostics, disease prevention. Human leukocyte interferon (give a description of the drug).

8. Bocavirus infection: etiology, pathogenesis and an algorithm for the etiological diagnosis of bocavirus infection from the standpoint of evidence-based medicine.

9. Coronaviruses. Diseases caused by the SARS-CoV coronavirus and SARS-CoV-2. Structural features and sensitivity of coronaviruses to physical and chemical factors. Life cycle of coronaviruses. Factors in the development and spread of diseases caused by the SARS-CoV and SARS-CoV-2 coronavirus (the causative agent of the coronavirus infection COVID-19), the pathogenesis of diseases. Epidemiological features of coronavirus infections. Coronavirus infection COVID-19: epidemiology, sources and routes of transmission, pathogenesis of infection from the standpoint of evidence-based medicine, the epidemic situation in the world and in Ukraine. Principles for the diagnosis of coronavirus infection COVID-19. General and specific laboratory diagnostics of COVID-19. Principles of specific and non-specific prevention of coronavirus infection COVID-19. International medical and social rules.

10. Parvoviruses: biological properties, epidemiology, pathogenesis of diseases caused by this virus. Laboratory diagnostics and disease prevention.

11. Causative agent of viral hepatitis A: general characteristics of the pathogen, antigenic structure. Epidemiology, pathogenesis, immunity, laboratory diagnostics, specific prevention of hepatitis A. Human immunoglobulin against hepatitis A (give a description of the drug).

12. Causative agent of parenteral viral hepatitis B: general characteristics, antigenic structure. Epidemiology, pathogenesis, immunity, principles of microbiological diagnostics, serological markers for diagnostics of hepatitis B. Pathogenesis of HBV / HDV coinfection from the standpoint of evidence-based medicine. Specific HBV vaccination, prevention of mother-to-child transmission. HBV vaccination calendar, frequent vaccinations. Serologic testing before and after HBV vaccination. Tactics in the absence of a response to vaccination. Measures to ensure the safety of blood. Genetically engineered (recombinant) hepatitis B vaccine (give a description of the drug).

13. Causative agent of parenteral viral hepatitis D: general characteristics, antigenic structure. Epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention of hepatitis D. Pathogenesis of HBV / HDV coinfection from the standpoint of evidence-based medicine.

14. Causative agent of hepatitis C: biological properties, antigenic structure. Epidemiology, pathogenesis, diagnosis, treatment and prevention of hepatitis C.

15. Causative agent of viral hepatitis E: general characteristics. Epidemiology, pathogenesis, immunity, laboratory diagnostics, disease prevention. Features of the use of ELISA for the diagnosis of hepatitis E - components, principle and accounting for the reaction.

16. Hepatitis viruses TVV and SEN: biological properties Epidemiology, pathogenesis and principles of diagnosis and prevention of hepatitis TVV and SEN.

17. Rotaviruses – general characteristic. Epidemiology and pathogenesis of diseases caused by rotaviruses, immunity, laboratory diagnostics, prevention of rotavirus diseases. Human leukocyte interferon (give a description of the drug).

18. Picornaviruses, general characteristics. Poliomyelitis viruses: antigenic structure. Epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention of poliomyelitis. The problem of polio eradication worldwide. Sebin's polio vaccine (give a description of the drug). Salk vaccine (give a description of the drug).

19. Picornaviruses, general characteristics. Coxsackie viruses: biological and antigenic properties. Epidemiology, pathogenesis of the disease, immunity, laboratory diagnosis of the disease caused by these viruses. Type-specific Coxsackie serum (give a description of the drug).

20. Picornaviruses, general characteristics. ECHO viruses: biological and antigenic properties. Epidemiology, pathogenesis, immunity, laboratory diagnostics of diseases caused by these viruses. NR: describe the components, principle and purpose of its use in the diagnosis of enterovirus infections.

21. Representatives of the Picornavirus family - rhinoviruses: biological properties, pathogenesis of diseases, immunity, laboratory diagnostics of diseases caused by these viruses. Prevention of rhinovirus infection.

22. Representatives of the Picornavirus family – cardioviruses: biological properties. Epidemiology, pathogenesis of diseases, immunity, laboratory diagnostics, prevention of diseases caused by these viruses.

23. The importance of caliciviruses in human infectious pathology. Epidemiology, pathogenesis, diagnosis and prevention of diseases caused by caliciviruses.

24. Human foot-and-mouth disease virus: biological properties of the pathogen, epidemiology, pathogenesis, principles of microbiological diagnosis and prevention of the disease.

25. Human immunodeficiency virus (HIV): morphology, antigenic structure, genome features, virus variability, HIV types, origin and evolution, interaction stages with sensitive cells; sensitivity to physical and chemical factors. HIV infection, HIV / HBV coinfection: pathogenesis, methods and criteria for diagnosing HIV infection; Evidence-Based Medicine Treatment; prospects for specific prevention. Pre-exposure and post-exposure prophylaxis of HIV infection. Principles of antiretroviral therapy. Vaccination of HIV-infected persons. Importance of immunoblotting in HIV infection prediction.

26. Alpha herpesviruses, general characteristics. Herpes simplex viruses type I. Epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention of type I herpes. Killed herpes vaccine (give a description of the drug).

27. Alpha herpesviruses, general characteristics. Herpes simplex viruses type II. Epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention of herpes II type. Inactivated cultured herpes simplex virus vaccine (give a description of the drug).

28. Alpha herpesviruses, general characteristics. Chickenpox and shingles viruses. Epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention of shingles. Live chickenpox vaccine (give a description of the drug).

29. Beta herpesvirus infections. Cytomegalovirus infection: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention.

30. Gamma herpesvirus infections. Infectious mononucleosis: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention. Antiherpetic fluorescent serum against EBV (give a description of the drug).

31. Poxviruses, general characteristics. Smallpox virus: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention. Smallpox vaccine (give a description of the drug).

32. Rhabdoviruses, general characteristics. Rabies virus, differentiation of wild and fixed strains. Epidemiology, pathogenesis, immunity, laboratory diagnostics, rabies prevention. Rabivak vaccine (give a description of the drug).

33. Rhabdoviruses. Vesicular stomatitis: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention.

34. Bunyaviruses: general characteristics. Crimea-Congo hemorrhagic fever: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention.

35. Bunyaviruses: general characteristics. Hemorrhagic fever with renal syndrome: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention.

36. Flaviviruses: general characteristics. Spring-summer tick-borne encephalitis: antigenic properties of the pathogen, epidemiology, pathogenesis, immunity, laboratory diagnostics, prevention. Specific homologous donor immunoglobulin and heterologous immunoglobulin against spring-summer tick-borne encephalitis (give a description of the drugs).

37. Viruses of the Ebolavirus genus of the Filoviridae family as causative agents of the disease regulated by the International Health Regulations: epidemiology, pathogenesis, diagnosis and prevention methods.

38. Marburg virus (MARV) and Ravn virus (RAVV) of the Filoviridae family as pathogens regulated by the International Health Regulations: epidemiology, pathogenesis, diagnosis and prevention methods.

39. Lassa fever: biological properties of the pathogen, etiology, epidemiology, pathogenesis and methods of disease diagnosis and prevention.

40. Zika fever virus: biological properties of the pathogen, etiology, epidemiology, pathogenesis and methods of disease diagnosis and prevention.

41. The concept of clinical microbiology, hospital and opportunistic infections. Causative agents of AIDS marker opportunistic infections. Epidemiology, pathogenesis, diagnosis, treatment and prevention of AIDS marker opportunistic pneumocystis pneumonia.

42. The causative agents of AIDS marker opportunistic infections. Epidemiology, pathogenesis, diagnosis, treatment and prevention of AIDS marker opportunistic papillomavirus infection. Gardasil (give a description of the drug).

43. The concept of clinical microbiology, hospital and opportunistic infections. The causative agents of AIDS marker opportunistic infections. Epidemiology, pathogenesis, diagnosis, treatment and prevention of AIDS marker opportunistic cytomegalovirus infection.

44. Prions: general characteristics. The mechanism of prion proteins formation. Diseases caused by prions: pathogenesis, immunity, laboratory diagnostics, disease prevention.

45. Slow viral infections: general characteristics. Causative agents of slow viral infections: pathogenesis, immunity, laboratory diagnostics. Live rabies vaccine Fermi (describe the drug).

46. Oncogenic viruses, general characteristics. L. A. Zilber viral-genetic theory of oncogenesis. The role of viruses in the etiology of leukemia and malignant tumors.

47. Human T-cell leukemia: biological properties of the pathogen, etiology, epidemiology, pathogenesis, viral carcinogenesis, features of immunity. Methods for diagnosis and prevention of the disease.